envelope is preferably produced in a two-step dialysis procedure where the "naked" envelope is formed initially, followed by unidirectional insertion of the viral surface glycoprotein of interest. This process and the physical characteristics of the resulting AVE are described in detail by Chander et al., (supra). Examples of AVE systems are (a) an AVE containing the HIV-1 surface glycoprotein gp160 (Chander et al., supra; Schreier et al., 1995, supra) or glycosyl phosphatidylinositol (GPI)-linked gp120 (Schreier et al., 1994, supra), respectively, and (b) an AVE containing the respiratory syncytial virus (RSV) attachment (G) and fusion (F) glycoproteins (Stecenko, A. A. et al., Pharm. Pharmacol. Lett. 1:127-129 (1992)). Thus, vesicles are constructed which mimic the natural membranes of enveloped viruses in their ability to bind to and deliver materials to cells bearing corresponding surface receptors.

AVEs are used to deliver genes both by intravenous injection and by instillation in the lungs. For example, AVEs are manufactured to mimic RSV, exhibiting the RSV F surface glycoprotein which provides selective entry into epithelial cells. F-AVE are loaded with a plasmid coding for the gene of interest, (or a reporter gene such as CAT not present in mammalian tissue).

The AVE system described herein in physically and chemically essentially identical to the natural virus yet is entirely "artificial", as it is constructed from phospholipids, cholesterol, and recombinant viral surface glycoproteins. Hence, there is no carry-over of viral genetic information and no danger of inadvertant viral infection. Construction of the AVEs in two independent steps allows for bulk production of the plain lipid envelopes which, in a separate second step, can then be marked with the desired viral glycoprotein, also allowing for the preparation of protein cocktail formulations if desired.

Another delivery vehicle for use in the present invention are based on the recent description of attenuated Shigella as a DNA delivery system (Sizemore, D. R. et al., Science 270:299-302 (1995), which reference is incorporated by reference in its entirety). This approach exploits the ability of Shigellae to enter epithelial cells and escape the phagocytic vacuole as a method for delivering the gene construct into the cytoplasm of the target cell. Invasion with as few as one to five bacteria can result in expression of the foreign plasmid DNA delivered by these bacteria.

A preferred type of mediator of nonviral transfection in vitro and in vivo is cationic (ammonium derivatized) lipids. These positively charged lipids form complexes with negatively charged DNA, resulting in DNA charged neutralization and compaction. The complexes endocytosed upon association with the cell membrane, and the DNA somehow escapes the endosome, gaining access to the cytoplasm. Cationic lipid:DNA complexes appear highly stable under normal conditions. Studies of the cationic lipid DOTAP suggest the complex

dissociates when the inner layer of the cell membrane is destabilized and anionic lipids from the inner layer displace DNA from the cationic lipid. Several cationic lipids are available commercially. Two of these, DMRI and DC-cholesterol, have been used in human clinical trials. First generation cationic lipids are less efficient than viral vectors. For delivery to lung, any inflammatory responses accompanying the liposome administration are reduced by changing the delivery mode to aerosol administration which distributes the dose more evenly.

The gene may be any gene appropriately expressed by the CD163 presenting cells. In one embodiment the gene may be a gene for CD163 as a gene therapy for individuals having reduced CD-163 expression.

In another embodiment the gene encodes an antigen for as a gene vaccination. In any situation it may be an advantage that macrophages do not multiply whereby this kind of gene therapy is an appropriate form of temporary gene therapy.

The gene therapy approach can be utilized in a site specific manner to deliver a retroviral vector to the tissue or organ of choice. Thus, for example, a catheter delivery system can be used (Nabel, E. G. et al., Science 244:1342 (1989)). Such methods, using either a retroviral vector or a liposome vector, is particularly useful to deliver the gene to a blood vessel wall.

Other virus vectors may also be used, in particular for human gene therapy, including recombinant adenovirus vectors.

A nontoxic and efficient method has recently been reported based on the Sendai virus, also known as hemagglutinating virus of Japan (HVJ). HVJ-liposome-mediated gene transfer is performed Morishita R et al., Hypertension (1993) 21:894-89.

Further, the substance of the Hp-Hb complex, or a part thereof may also comprise a tracer or a marker, such as chromophores, fluorphores, biotin, isotopes, enzymes, for identifying the cells presenting the CD163 receptor or a variant thereof. Thereby Hp-Hb complex may be used for diagnostic purposes as well.

In one embodiment the Hp-Hb complex or fragment thereof or mimic thereof being operably linked to a substance is capable of binding a CD163 variant only, in order to avoid binding to the naturally occurring CD163 receptor on macrophages. Thereby it is possible to direct a substance to a subgroup of cells presenting the CD163 variant only.

It is another object of the present invention to use a CD163 molecule as a medicament. Use of a CD163 molecule in the manufacture of a medicament for treatment of haemolysis in an individual in need of such treatment. There are a number of application fields, wherein one is the use of a CD163 molecule for the removal of at least one Hp-Hb complex in serum and/or plasma of an individual. A second application is the use of a CD163 molecule for the determination of the haemolysis rate of an individual. Further, the use of at least one complex comprising haemoglobin and haptoglobin as a marker for a cell, such as a macrophage expressing a CD163 molecule, wherein at least one of the haemoglobin or haptoglobin molecules are labelled is yet another application area.

According to the invention the term "CD163 variant" is meant to include functional equivalents of CD163, or a fragment of CD163, said CD163 comprising a predetermined amino acid sequence. Thus, a CD163 variant is different from native CD163. A "variant" is defined as:

iv) variants comprising an amino acid sequence capable of being recognised by an antibody also capable of recognising the predetermined amino acid sequence, and/or

v) variants comprising an amino acid sequence capable of binding to a Hp-Hb complex also capable of binding the predetermined amino acid sequence, and/or

vi) variants having at least a substantially similar binding affinity to at least one Hp-Hb complex as said predetermined amino acid sequence.

By the term "predetermined amino acid sequence" is meant any of the amino acid sequences depicted in Figure 5a and 5b, i.e. any of the sequences for CD163 having the following sequence identification in sequence database trEMBL:

tr|Q07898|Q07898
tr|Q07901|Q07901
tr|Q07900|Q07900
tr|Q07899|Q07899

"Functional equivalency" as used in the present invention is according to one preferred embodiment established by means of reference to the corresponding functionality of a predetermined CD163 fragment.